

Ideas for Science and Technology Fair projects

NZIFST provides prizes, and where available judges, for the Regional Science and Technology Fairs. Prizes are awarded to projects best demonstrating the principles of food science and technology.

Important note: in the food processing industry, we do not measure ingredients in cups or spoons, as it is not sufficiently accurate to enable reproducibility and “fair testing”. Where possible we weigh ingredients. For liquid ingredients used in small quantities, we measure them in millilitres.

Here are some suggestions for Science and Technology Fair projects, from NZIFST members:

- Which varieties of potatoes are better suited to boiling, which to frying and which to roasting? Explain the science behind this.
- Investigate the science behind making the perfect roast potato, considering one or more of the following variables:
 - Variety of potato used
 - Age of potato used
 - Type of cooking fat/oil used
 - Time spent in the oven
 - Temperature of the oven
- Investigate the fat content of different brands and styles (e.g. wedges, shoe-strings) of potato fries.
- Investigate the fat content of different brands of potato chips.
- Investigate the difference between ‘modern’ wheat and spelt.
- Analyse the pH, citric acid and Vitamin C levels of a range of different fruits, and compare these to their flavours profiles.
- Investigate factors affecting the browning of cut fruit (e.g. bananas, apples, pears, stonefruit, avocados). How do the fruit variety, storage temperature before and after cutting, packaging and the use of preserving agents (like lemon juice) affect the rate of browning?
- Which fruits can be used to tenderise meat, and how do they work?
- Investigate the effect of pH on anthocyanin stability in fruit products.
- Is it true that fruit ripens faster if you put it in a bag with an apple or a banana? If yes, how does it work, and does it work for all fruit?
- Investigate the factors affecting egg white performance when making a Pavlova. What factors affect the performance of the egg whites e.g. freshness of the eggs, temperature of the egg whites, beating time, beating speed etc.
- Is it true that adding a little salt, or cream of tartar, or lemon juice, to egg whites before whipping them, makes them whip up faster?
- Are eggs ‘really good for you’?
- Investigate the function of egg in a mayonnaise. How does the quantity of egg used affect the physical and sensory properties of the mayonnaise?
- Conduct sensory evaluation of different sugar replacers e.g. fruit concentrates (monk fruit), sucralose, stevia, in a food product e.g. drink.

- Investigate the effect of replacing sugar with artificial or natural sweeteners, on the appearance, flavour, aroma and texture of baked products e.g. cakes, muffins, biscuits.
- How does the quantity of sugar affect the texture of chocolate cake? For a given recipe, what happens if you increase or decrease the sugar content by 5, 10, 15 or 20%?
- How does the type of flour affect the sensory properties of bread (e.g. standard flour, high grade flour, 50:50 mix of both). What happens to the texture and loaf height?
 - What about scones or cakes?
 - What happens to the texture and loaf height when you replace some of the wheat flour with other flours, like oat, rye, spelt, wholemeal?
- Investigate the impact of the amount of salt / sodium on the taste and texture of a yeast-leavened bread.
- Compare the sensory properties of different low carbohydrate breads.
- Investigate the effect of the yeast culture on the flavour and texture of sour dough bread.
 - Do the properties of sour dough bread change as the culture matures?
 - Are the properties of sour dough bread affected by the conditions (e.g. temperature) under which the culture is grown and stored?
- Investigate the effect of adding sugar on browning of savoury baked goods (e.g. cheese muffins). How does the amount of sugar added influence the baking temperature and time required for the product to brown? What is the optimum amount of sugar to add without adversely affecting flavour and texture?
- Conduct sensory evaluation on cookies made with a variety of different
 - flours (e.g. standard, high grade, wholemeal, oat), or
 - raising agents (e.g. baking powder, baking soda), or
 - shortenings (e.g. butter, margarine, animal fat, vegetable oils)
 to identify which is the most acceptable to school children.
- Compare the characteristics of different brands of the same biscuit. For example, for Tim Tams vs Chit Chats, determine the temperature at which the chocolate coating melts, the thickness and crunchiness of the biscuit. How do these affect the sensory characteristics (eating quality) of the biscuit? You could do the same investigation with chocolate-coated wheaten biscuits.
- Which type of cow's milk (trim, skim, low fat, standard, full fat, unhomogenised) makes the best frothy milk for cappuccino? How does the level of fat and protein in the milk affect the frothing properties of the milk?
- Which brand of soy milk produces the best frothy milk? Why?
- Do other vegetable-based "milks" e.g. oat milk, almond milk, rice milk, coconut milk, produce frothy milk? Why?
- Can you make a vegan yoghurt-like product from ingredients other than milk from an animal?
- Investigate the optimum conditions for making a fermented vegetable product like sauerkraut and kimchi.
 - What fermentation temperature is best for flavour and fermentation speed?
 - What effects do salt and sugar levels have?
 - Do the presence and amount of other ingredients (chilli, onion, ginger, garlic, etc.) affect the fermentation as well as the flavour?
 - How does the moisture content affect fermentation?
 - How does the presence/absence of air affect fermentation?
 - Does the size of the vegetable cut (fine, medium, coarse shred) affect the fermentation?
 - How do the pH, Vitamin C level and aroma change during fermentation?
 - How many bacteria are there at the beginning and end of fermentation?

- Does the viscosity (thickness) of a drink affect its taste? Modify the viscosity using thickening agents e.g. xanthan gum. Compare dairy-based beverages and fruit-based beverages.
- Does the presence of acids, from ingredients such as lemon juice, affect our perception of sweetness?
- How much moisture can snack foods (e.g. potato chips, corn chips, extruded snacks like Grain Waves, cheezels, Burger Rings etc.) absorb before they lose their crispness when they are taken out of the packaging? How long does it take for them to lose crispness?
- Investigate the physical, chemical and sensory properties of different honeys (e.g. manuka, rewarewa, clover, borage, tawari, thyme, kamahi etc.).
- Do ingredients such as garlic, onions, cumin, rosemary, salt, pepper and other herbs and spices, improve the keeping quality of foods? If yes, why?
- Investigate the benefits (other than nutritional) of using vegetable oils in cooking, as compared to animal fats.
- Investigate the causes of rancidity of oil-based and fat-based products, and discuss which are most likely to occur in the home, and why.
- Does butter butter better? Compare the spreadability and taste of equivalent amounts of butter straight from the fridge and warmed to room temperature (record room temperature), when spread on plain white bread.
- Protein in our diets; do meat substitutes cut the mustard?
- Going vegetarian is a popular dietary option, but do you get enough iron and protein? Take representative portions of vegetarian meals that you or your friends eat and measure the soluble iron content. Compare it with dietary recommendations. What foods could you add to the meals to improve iron availability?
- How does the position of food in a microwave affect the rate of heating?
 - If you are reheating a plate of cooked food, comprising several discrete components (e.g. meat, potatoes, carrots, peas), what is the ideal position of each component on the plate to get optimal reheating of the plate of food – so no component is still cold, or too hot?
 - If you are going to freeze the meal, what degree of pre-cooking of each component is ideal, and where on the plate should you put it, to ensure an evenly cooked and evenly heated meal out of the microwave?
 - What characteristics of the components influence the rate at which they heat in the microwave?